

### REMARKS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1 and 3-7 are presently active in this case. The present Amendment amends Claims 1 and 5, adds new Claim 7 without introducing any new matter, and cancels Claim 2 without prejudice or disclaimer.

In the outstanding Office Action, Claims 1-4 were rejected under 35 U.S.C. §102(b) as anticipated by Ishida et al. (U.S. Patent No. 6,173,576, herein "Ishida"); and Claims 5-6 are rejected under 35 U.S.C. §103(a) as unpatentable over Ishida in view of Ishikawa et al. (U.S. Patent No. 6,728,102, herein "Ishikawa").

First, Applicants wish to thank Examiners Feild and Wright for the courtesy of an interview granted to Applicants' representative on May 5, 2006, at which time the outstanding issues in this case were discussed. Claim amendments and comments similar to the ones developed hereinafter were presented and the Examiners indicated that they would reconsider the outstanding grounds for rejection upon formal submission of a response.

Claim 1 is amended to recite a flow path including a first flow channel and a second flow channel. These changes find non-limiting support in Applicants' disclosure as originally filed, for example at page 13, lines 21-25 and in corresponding Figure 6. Further, Claim 1 is amended to recite that the heat intake portion is *upstream of the cooling portion* and the heat outlet portion is *downstream of the cooling portion*, and that heat is conducted from the cooling medium "before the cooling medium arrives at the cooling portion." These features find non-limiting support in Applicants' disclosure as originally filed, for example at page 12, lines 5-8 and in Figure 7. Independent Claim 5 is amended to recite a similar feature, and to further recite an auxiliary heat radiation unit. The features regarding an

auxiliary heat radiation unit find non-limiting support in Applicants' disclosure at page 15, lines 18-23, and in corresponding Figures 7 and 9.

In light of the amendments to independent Claims 1 and 5, Applicants respectfully traverse the rejection of Claims 1-4 under 35 U.S.C. §102(b), and request reconsideration of the rejection, as next discussed.

Briefly recapitulating, Claim 1 relates to a cooling device configured to cool an electronic element producing concentrated heat by a flow of a cooling medium, including a cooling portion configured to cool the electronic element by the flow of the cooling medium; a first flow channel disposed upstream of the cooling portion in the flow of the cooling medium; a second flow channel disposed downstream of the cooling portion in the flow of the cooling medium; and an active heat transport element including a heat intake portion and a heat outlet portion, the active heat transport element configured to conduct heat from the heat intake portion to the heat outlet portion, the heat intake portion being upstream of the cooling portion and thermally connected with the first flow channel *so as to conduct heat from the cooling medium before the cooling medium arrives at the cooling portion*, the heat outlet portion being downstream of the cooling portion and thermally connected with the second flow channel so as to conduct heat to the cooling medium.

As explained in Applicants' specification at page 12, lines 2-14, Claim 1 improves upon background cooling devices, since the operation temperature of the device that is to be cooled can be decreased, because the device is cooled with a cooling medium that is *pre-cooled* by the active heat transport element.

Turning now to the applied reference, Ishida describes a cooling unit for an integrated circuit with peltier elements, with a plurality of peltier elements 18 mounted onto a base plate 16, the base plate 16 being connected to the integrated circuit package 12 that has to be

cooled.<sup>1</sup> The peltier elements are separated by channels 20, and air can circulate through the channels 20 to the main duct 29.<sup>2</sup> However, Ishida fails to teach or suggest

the active heat transport element configured to conduct heat from the heat intake portion to the heat outlet portion, the heat intake portion being upstream of the cooling portion ... *so as to conduct heat from the cooling medium before the cooling medium arrives at the cooling portion*, the heat outlet portion downstream of the cooling portion ... *so as to conduct heat to the cooling medium*,

as recited in amended, independent Claim 1. The outstanding Office Action asserts that Ishida's Figure 2 shows such a feature at the areas 1 and 2.<sup>3</sup> Applicants respectfully disagree, since Ishida explicitly states that "[h]eat generated by integrated circuit 14 may conduct through the base plate 16 and into the peltier devices 18 and fins 22,"<sup>4</sup> and that "air flow through the channels 20 and 26 ... removes heat from the peltier devices 18 and the fins 22."<sup>5</sup> Accordingly, Ishida fails to teach or suggest that heat is conducted from the cooling medium before the cooling medium arrives at the cooling portion, as recited in amended independent Claim 1.

Moreover, the first flow channel cannot be found in Figure 2 of Ishida since "the heat intake portion being upstream of the cooling portion and thermally connected with the first flow channel so as to conduct heat from the cooling medium," as recited in amended Claim 1, is not disclosed. As explained above, Ishida describes that heat generated by the integrated circuit 14 may conduct through the base plate 16 and into the peltier devices 18 and fins 22.<sup>6</sup>

For at least the foregoing reasons, Applicants submit that Ishida fails to teach or suggest all the features of Claim 1. Accordingly, Applicants believe that the rejection of Claims 1-4 is overcome and respectfully requests reconsideration of the rejection based on Ishida.

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<sup>1</sup> See Ishida in the Abstract, Figures 1-2, and at column 2, lines 19-25.

<sup>2</sup> See Ishida at column 2, lines 7-23, and in corresponding Figure 2.

<sup>3</sup> See the outstanding Office Action at page 2, lines 20-24.

<sup>4</sup> See Ishida at column 2, lines 32-34.

<sup>5</sup> See Ishida at column 2, lines 37-39.

<sup>6</sup> See Ishida for example at column 2, lines 31-33.

In response to the rejection of Claims 5-6 under 35 U.S.C. §103(a), since the rejection of independent Claim 1 is believed to be overcome, the rejection of dependent Claims 5-6 is believed to be overcome. Furthermore, the reference Ishikawa fails to remedy the deficiencies of Ishida. Ishikawa describes an electronic apparatus with a heat receiving portion connected to a heat generating component, wherein a heat transmitting case 34 is divided in the inside into flow paths 36 for conducting liquid coolant.<sup>7</sup> Ishikawa also fails to teach or suggest

configured to conduct the cooling medium from the first flow channel through the cooling portion to the second flow channel, the first flow channel being upstream of the cooling portion and thermally connected with the heat intake portion so as *to conduct heat from the cooling medium to the heat intake portion before the cooling medium arrives at the cooling portion*

as recited in amended independent Claim 5. In addition, in Ishikawa, there is no active heat transport element configured to conduct heat from the heat intake portion to the heat outlet portion. Ishikawa explicitly states that "[t]he heat transmitting case 34 is thermally in contact with the IC chip 14 through the heat transmitting sheet."<sup>8</sup>

Therefore, even if the combination of Ishida and Ishikawa is assumed to be proper, the combination fails to teach every element of the claimed invention. Specifically, the combination fails to teach the claimed features regarding the active heat transport element. Accordingly, Applicants respectfully traverse, and request reconsideration of, this rejection based on these patents.<sup>9</sup>

Consequently, in view of the present Amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in

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<sup>7</sup> See Ishikawa at column 8, lines 35-51 and in corresponding Figures 3 and 16.

<sup>8</sup> See Ishikawa at column 8, lines 62-64, and in corresponding Figure 9.

<sup>9</sup> See MPEP 2142 stating, as one of the three "basic criteria [that] must be met" in order to establish a *prima facie* case of obviousness, that "the prior art reference (or references when combined) must teach or suggest all the claim limitations," (emphasis added). See also MPEP 2143.03: "All words in a claim must be considered in judging the patentability of that claim against the prior art."

condition for formal Allowance. A Notice of Allowance for Claims 1 and 3-7 is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact Applicants' undersigned representative at the below listed telephone number.

Respectfully submitted,

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